

Applicant amended the language of independent claims 1, 26, 44, 62, 81, and 100 to recite that the trailing end of the implant has a "maximum height" that is "adapted to fit within the disc space and between the vertebral bodies adjacent to the disc space." No such structure is taught, disclosed, or suggested by Henderson et al. and Benzel et al. either alone or when properly combined.

Henderson et al. discloses a fusion stabilization chamber having an end portion with flanges. (See, Henderson et al., Col. 10, lines 46-50; Figs. 8-14). The trailing end of the Henderson et al. implant has a height greater than the distance between the adjacent vertebral bodies. The trailing end of the Henderson et al. implant is not adapted to fit within the disc space. Benzel et al. discloses a spinal column retaining apparatus including a pair of rods (12, 14) and plates (30, 32) which engage the rods. Fasteners (38-48) connect the plates to the vertebrae. (Benzel et al. Col. 2, lines 29-35). Plates 30, 32 have inner side surfaces (64, 164) adapted to engage the anterior surface of the vertebrae. (Benzel et al., Col. 3, lines 1-5; and Col. 6, lines 6-11). The plates of Benzel et al. do not have a maximum height that is adapted to fit within the disc space and between the vertebral bodies adjacent to the disc space as recited in Applicant's claimed invention.

Applicant further respectfully submits that the combination of Henderson et al. with Benzel et al. is improper. MPEP § 2143 states that in order to establish a prima facie case of obviousness, "there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings." (MPEP § 2143, page 2100-122, 2nd col. (August 2001)). The Examiner states in the Office Action that

"given the teaching of Benzel et al. it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the partially circumferentially screw holes in the device Henderson et al. to secure the implant to the associated bone portions." (See, Office Action, page 3, first full paragraph). Applicant respectfully submits that the Examiner's asserted motivation is inapplicable because Henderson et al. already accomplishes without modification what the Examiner states is the reason to combine the teachings of Benzel et al. with Henderson et al., i.e., securing the implant to the associated bone portions. (See, e.g., flanges 50, 51 in Figs. 8 and 9 of Henderson et al.). Neither Henderson et al. nor Benzel et al. contain any suggestion or motivation to include bone screw receiving holes as taught by Benzel et al. with a spinal implant such as taught by Henderson et al. Thus, Applicant respectfully submits that the rejection be withdrawn. (See, MPEP § 2145(X)(C) "Lack of Suggestion to Combine References" page 2100-152, 2nd col. (August 2001)).

Applicant submits that Henderson et al. and Benzel et al., whether alone or in proper combination, fail to teach or suggest the subject matter of many of Applicant's dependent claims. For example only, dependent claims 12, 33, 51, 70, 90, and 108 recite a pair of screw receiving holes along an upper edge and a pair of screw receiving holes along a lower edge of the trailing end of the implant, "one of said pair of bone screw receiving holes being adapted to position bone screws in a convergent relationship to one another." Neither Henderson et al. nor Benzel et al., alone or in proper combination, teach or suggest such an arrangement.

Applicant submits independent claims 1, 26, 44, 62, 81, and 100 are allowable and that dependent claims 2-25, 27-43, 45-61, 63-80, 82-99, and 101-148 dependent

from one of independent claims 1, 26, 44, 62, 81, and 100, or claims dependent therefrom, respectively, are allowable at least due to their dependency from an allowable independent claim. Applicant submits that the rejections of claims 1-148 over the art of record have been overcome. Issuance of a timely Notice of Allowance of the claims is earnestly solicited.

In view of the foregoing amendments and remarks, Applicant respectfully requests the reconsideration and reexamination of this application and the timely allowance of the pending claims.

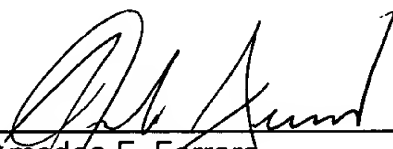
To the extent any extension of time under 37 C.F.R. § 1.136 is required to obtain entry of this reply, such extension is hereby respectfully requested. If there are any fees due under 37 C.F.R. §§ 1.16 or 1.17 which are not enclosed herewith, including any fees required for an extension of time under 37 C.F.R. § 1.136, please charge such fees to our Deposit Account No. 50-1066.

Respectfully submitted,

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CHANGES TO THE CLAIMS

1. (Amended) A spinal implant for insertion at least in part across at least the height of a disc space between adjacent vertebral bodies, said implant comprising:

opposed upper and lower surfaces adapted to be placed toward and in contact with each of the adjacent vertebral bodies, respectively, from within the disc space;

a leading end for insertion into the disc space and between the adjacent vertebral bodies;

a trailing end opposite said leading end, said trailing end having an exterior surface and an outer perimeter with an upper edge and a lower edge adapted to be oriented toward the adjacent vertebral bodies, respectively, said trailing end having a maximum height as measured from said upper edge to said lower edge adapted to fit within the disc space and between the vertebral bodies adjacent to the disc space; and

a plurality of bone screw receiving holes in said trailing end, at least one of which is adapted to only partially circumferentially surround a trailing end of a bone screw adapted to be received therein, at least one of said bone screw receiving holes passing through said exterior surface and one of said edges so as to permit the trailing end of the bone screw to protrude beyond said one of said edges.

4. (Amended) The implant of claim 1, wherein said implant has a height equal to the distance between the adjacent vertebral bodies ~~where installed into the~~ of a normal disc space ~~when installed.~~

26. (Amended) A spinal implant for insertion at least in part across at least the height of a disc space between adjacent vertebral bodies, said implant comprising:

opposed upper and lower surfaces adapted to be placed toward and in contact with one

each of the adjacent vertebral bodies, respectively, from within the disc space;

a leading end for insertion between the adjacent vertebral bodies; and

a trailing end opposite said leading end, said trailing end having an upper edge and a lower edge, said trailing end having a maximum height as measured from said upper edge to said lower edge adapted to fit within the disc space and between the vertebral bodies adjacent to the disc space, said trailing end being adapted to only partially circumferentially surround the circumference of at least one bone screw adapted to be received therein.

29. (Amended) The implant of claim 26, wherein said implant has a height equal to the distance between the adjacent vertebral bodies ~~where installed into the~~ of a normal disc space ~~when installed~~.

44. (Amended) A spinal implant for insertion at least in part across at least the height of a disc space between adjacent vertebral bodies, said implant comprising:

opposed upper and lower portions adapted to be placed toward and in contact with each one of the adjacent vertebral bodies, respectively, from within the disc space;

a leading end for insertion into the disc space and between the adjacent vertebral bodies; and

a trailing end opposite said leading end, said trailing end having an upper edge, a lower edge, and a maximum height therebetween, said maximum height being adapted to fit within the disc space and between the vertebral bodies adjacent to the disc space, said trailing end being adapted to receive at least a portion of a bone screw passing therein that extends beyond said maximum height immediately adjacent thereto.

47. (Amended) The implant of claim 44, wherein said implant has a height equal to the distance between the adjacent vertebral bodies ~~where installed into the~~ of a normal disc space

~~when installed.~~

62. (Amended) A spinal implant for insertion at least in part across at least the height of a disc space between adjacent vertebral bodies, said implant comprising:

opposed upper and lower surfaces adapted to be placed toward and in contact with each one of the adjacent vertebral bodies, respectively, from within the disc space;

a leading end for insertion into the disc space and between the adjacent vertebral bodies; and

a trailing end opposite said leading end, said trailing end having a plurality of bone screw receiving holes, an upper edge, a lower edge, and a maximum height therebetween, said maximum height being adapted to fit into the disc space and between the vertebral bodies adjacent to the disc space, said maximum height of said trailing end being adapted to be less than the sum of the maximum diameter of two bone screws adapted to be inserted in said bone screw receiving holes, said bone screw receiving holes being adapted to incompletely circumferentially receive at least one of the bone screws.

65. (Amended) The implant of claim 62, wherein said implant has a height equal to the distance between the adjacent vertebral bodies ~~where installed into the~~ of a normal disc space ~~when installed.~~

70. (Amended) The implant of claim ~~69~~70, wherein said plurality of bone screw receiving holes includes a pair of screw receiving holes along said upper edge and a pair of screw receiving holes along said lower edge, one of said pair of bone screw receiving holes being adapted to position bone screws in a convergent relationship to one another.

81. (Amended) A spinal fusion implant for insertion at least in part across at least the height

of a disc space between adjacent vertebral bodies, said implant comprising:

~~an implant having:~~

opposed upper and lower surfaces adapted to be placed toward and in contact with each of the opposed adjacent vertebral bodies, respectively, from within the disc space;

a leading end for insertion into the disc space and between the adjacent vertebral bodies;

a trailing end opposite said leading end, said trailing end having an exterior surface and an outer perimeter with an upper edge and a lower edge adapted to be oriented toward the adjacent vertebral bodies, respectively, said trailing end having a maximum height as measured from said upper edge to said lower edge adapted to fit within the disc space and between the vertebral bodies adjacent to the disc space; and

a plurality of bone screw receiving holes in said trailing end, at least one of which is adapted to only partially circumferentially surround the trailing end of a bone screw adapted to be received therein, at least one of said screw receiving holes passing through said exterior surface and one of said edges so as to permit the bone screw to protrude over one of said edges within a plane of said trailing end; and

at least one bone screw, said screw having:

a leading end for placement in the vertebral body; and opposite,

a trailing end adapted to cooperatively engage said implant so as to prevent the further advancement of the screw into the bone and to be retained within said implant.

84. (Amended) The implant of claim 81, wherein said implant has a height equal to the distance between the adjacent vertebral bodies ~~where installed into the~~ of a normal disc space ~~when installed.~~

100. (Amended) An interbody spinal implant for insertion at least in part across at least the height of a disc space between adjacent vertebral bodies, said implant comprising:

opposed upper and lower surfaces adapted to be placed toward and in contact with each of the adjacent vertebral bodies, respectively, from within the disc space;

a leading end for insertion into the disc space between the adjacent vertebral bodies;
and

a trailing end opposite said leading end, said trailing end having an exterior surface and an outer perimeter with an upper edge and a lower edge adapted to be oriented toward the adjacent vertebral bodies, respectively, said trailing end having a maximum height as measured from said upper edge to said lower edge adapted to fit within the disc space and between the vertebral bodies adjacent to the disc space; said outer perimeter having at least one gap therein for permitting a portion of a bone screw to protrude over the outer perimeter of said trailing end within a plane of said trailing end, said gap being sufficient to retain a trailing end of the bone screw.

103. (Amended) The implant of claim 100, wherein said implant has a height equal to the distance between the adjacent vertebral bodies ~~where installed into the~~ of a normal disc space ~~when installed.~~